REMARKS

This application is being amended to enhance the description of the invention, to amend claims, and to add claims to previously described subject matter. Claims 8, 12 and 33 have been amended, and claims 23-34 are new.

This application has been amended to include Figures 7A-7C and the text of page 8 which both describe the extending of a contact through the previously disclosed pocket. These Figures are additional views of the already described and shown contacts and pockets. The applicant respectfully submits that no new matter has been added by this amendment because the pockets are shown in Figures 4-7, contacts are shown as extending through the contacts in Figure 8, 9, 22, and 23, and there is support for the amendment including the gap 25a at *inter alia* page 2, lines 21-24; page 7, line 9 through page 8, line 12; page 11, lines 18-26; and page 12, lines 8-11 and Figures 8, 9, 22, and 23.

Figures 24C and 24D relate to the plug and receptacle contacts and are cross-sections of the receptacle contacts and the receptacle contacts mated with the plug contacts. Both the receptacle and plug contacts have already been shown in either Figures 1, 8, 16, 19, 24, or 24A. Figure 24D is a cross-section through Figure 24, and Figure 24C is a cross-section through the plug contacts of Figure 16 mated with the receptacle contacts of Figure 24. Thus, there is support for these additional Figures and they are additional views of the disclosed subject matter. Moreover, the discussion added on page 15 with reference to these Figures relates to the already described plug and ground contacts and their mating, which can already be understood with

reference to the Figures showing the plug and receptacle contacts 1, 8, 16, 19, 24, and the discussion of the contacts and their mating already provided at *inter alia* page 11, line 7-page 12, line 11; page 13, line 31-page 14, line 12; and page 15, line 1-page 16, line 4.

The paragraphs beginning on page 17, line 24 and page 25 line 21 have been amended to specify that the I-Beam approach uses grounding plates and to delete the reference to stripline when used with the term I-Beam. This is merely a terminology change. The I-Beam embodiment that uses grounding plates has already been fully described at *inter alia* Figures 29 and 32, which show the grounding plates for the I-Beam approach, and in the text at page 17, line 24 to page 18, line 2. Figure 32 has likewise been amended to delete the reference to stripline with the I-Beam embodiment. Claims have been amended to delete the reference to stripline and support for these claims can be found at *inter alia* in Figures 29 and 32 and page 17, line 24 to page 18, line 2.

The paragraph beginning on page 23, line 27 has been amended to state that the receptacle contacts are center aligned with the center member of the receptacle. This has already been shown and described *inter alia* Figures 21, 23, 24 and page 13, line 27-30 and page 14, lines 13-16.

New claims 31-34 have been added to further claims combinations of aspects of the invention. Support for these claims may be found at *inter alia* Figures 1-9 and 16-24 and pages

5-16. Applicants believe that the foregoing amendment places the application in condition for allowance, and respectfully request a notice of allowance.

Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

Respectfully submitted,

Michael J. Bonella
Registration No. 41,628

Date: 2/1/2

WOODCOCK WASHBURN LLP
One Liberty Place - 46th Floor
Philadelphia, PA 19103
(215) 568-3100

VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Please insert the following paragraphs on page 3, line 27:

Figure 7A is a cross section taken through line 7A-7A of Figure 8;

Figure 7B is a cross-section through line 7B-7B of Figure 7A;

Figure 7C is a cut away perspective view of a contact end extending through a pocket looking down into a pocket;

Please insert the following paragraph on page 3, line 30;

Figure 24C is a cross-section taken through the plug contacts of Figure 16 mated with the receptacle contacts of Figure 24;

Figure 24D is a top view of the receptacle contacts taken along line 24D-24D of Figure 24;

Please insert the following paragraph on page 8, line 7:

Figures 7A-7C depict the end of a contact (could be any of the contacts 59, 61, 84, 86 described in detail below) extending through a pocket 25. Figures 7A and 7B are cross-sections showing a contact end extending through a recess 22 and a pocket 25. Figure 7C is a cut away isometric view showing the contact end extending through the recess 22 and the pocket 25. It will be appreciated that the other contacts likewise extend through the other pockets 25 and recesses 22 as shown in Figure 8. Figure 7C is a cut away perspective view looking down into a pocket as in Figure 7 with a contact 59, 61, 84, 86 extending through the recess into the pocket and there being the gap 25a disposed around the contact. It will also be appreciated that although Figures 7A and 7B are cross-sections through the plug assembly, the receptacle assembly is in this respect similar, as it contacts also extend through the recesses into the bases pockets in the interstitial diamond configuration. As shown with the diamond configuration, wetting around the entire periphery of the contact end extending through the recess 22 is ensured because there is a gap 25a around the periphery of the contact end within the pocket due to the diamond shape. This is also shown with reference to Figure 7 and Figure 8.

Please amend the paragraph beginning on page 13, line 27 as follows:

Extending longitudinally along the underside of the receptacle cover 70 is preferably a support member 90. The support member 90 preferably has a plurality of ridges 92 and grooves

94 for receiving a receptacle contact assembly member 96, as shown in the cross-section of Figure 23. As is also shown in Figure 23, the contact assembly is preferably center aligned with the support member 96. By aligning the receptacle contact assembly in a groove of the support member 96, the contact assembly is aligned within the receptacle from the center. This is in contrast to a design in which the contacts assembly would be aligned from its lateral edges. This center alignment feature is a preference and the invention can be practiced with or without this feature and is only limited as stated expressly in the claims.

Please amend the paragraph beginning on page 13, line 31 as follows:

Figure 24 depicts a perspective view of a preferred embodiment of a receptacle contact assembly 72 that can be used with this invention before it has been singulated to remove portions 98. The receptacle contact assembly 72 includes alternating ground 84 and signal 86 contacts and a plastic carrier 100. Figure 24D is a top view looking down onto Figure 24 with the carrier 98 removed and depicts the arrangement of signal and ground contacts. Although the contacts differ in construction, the general construction of the receptacle contact assembly 72 can be understood with reference to the discussion regarding the plug contact assembly 16. The receptacle contacts are preferably stamped and then molded to a plastic carrier 100. They are then singulated to remove unwanted portions 98. The ends 102 of the receptacle contacts can be but need not be gold striped to ensure wetting with solder 29 when disposed in a base pocket 25 as shown in Figures 22 and 23. The mating ends of the contacts can also be gold striped for high

reliability and to reduce mating forces. The ends 104 of the plastic carrier 100 are preferably sized and shaped so that they can be inserted into the slots 30 of the base 14, as shown in Figure 19.

Please amend the paragraph beginning on page 15, lines 11-20 as follows:

Figure 24A is a schematic diagram of the arrangement of the signal and ground contacts in the first preferred embodiment. The signal and ground contacts are oriented in what is referred to as an "in-line stripline" configuration. In this configuration, there are individual ground contacts 59, 84 on either side of each signal contact 61, 86, which can also be understood with reference to Figures 3 and 19. As will be appreciated from Figures 3 and 19, individual ground contacts 59, 84 are disposed on either side of the signal contacts 61, 86 to provide an electrical ground reference for the signal contacts and to provide the electrical stripline configuration. The mating of the signal and ground contacts of the plug and receptacle assemblies is also shown in Figure 24C. As shown, the straight plug ground and signal contacts 59, 61 alternate in a relatively straight row, and the receptacle contact beams (each receptacle signal contact 86 has two beams as shown in Figure 24 and each receptacle ground contact and each plug signal and ground contact has a single beam as shown in figures 24 and 16) alternate in the pattern ground 84, signal 86, signal 86, and ground 84. As is also shown, every other ground receptacle contact 84 mates with the opposing lateral side of a plug ground contact 59. Therefore, the two ground receptacle contacts 84 adjacent to a given pair of receptacle signal contacts 86 mate on either

lateral side of the ground plug contacts 59. This ensures that at least one of the receptacle ground contacts 84 on either side of a given pair of receptacle signal contacts 86 will be mated in the event there is any misalignment between the receptacle and plug contacts. For example, if the receptacle contacts and the plug contacts are misaligned up or down as viewed in Figure 24C due to manufacturing or any other reason, at least every other ground contact will provide a solid mating and good ground. This is because every other ground receptacle contact 84 is mated to the opposing lateral side of a ground plug contact 59, thereby ensuring that if there is misalignment in one direction, at least of one of the contacts will mate. The reason that the receptacle ground contacts 84 mate on opposing sides of every other plug ground contact is that they oriented with the alternating curvature as shown in Figure 24. The first ground receptacle contact–the first one on the left hand side of the drawing, curves out of the page, the second curves into the page, and this pattern continues in an alternating fashion to ensure mating on alternating sides of the plug contacts. The geometric relationship between the signal and ground contacts, including the gap H, the thickness t, the width w and pitch p, can be varied to achieve the desired connector impedance and electrical performance.

Please amend the paragraph starting on page 15 line 21 as follows:

Although this invention is not limited to such in-line stripline configurations, the in-line stripline configuration has several advantages (relative to the I-Beam approach described below that uses grounding plates on either side of a row of signal contacts) including advantages in

terms of costs and manufacturing. For example, the same contact can be used in all locations, and the contacts can be continuously stamped, which produces relatively consistent contact gaps (H). This is beneficial in achieving the desired optimum electrical performance. Additionally, all connector contacts can be used for either differential or single ended signals or any combination of these. Molding of the carrier 104 shown in Figure 24 is also easier because the contacts can be molded in a vertical row with contacts oriented so that the thin width is in the direction of mold closing. Another advantage is that because ground planes are not used, the connector mass (including its thermal mass) is lower which results in easier application to customers' printed circuit boards (PCB).

Please amend the paragraph starting on page 17, line 24 as follows:

Figure 32 is a schematic description of the configuration of the contacts in the second embodiment. This arrangement is referred to as an [a stripline] I-Beam configuration with grounding plates. In this configuration ground plates 606 provide the electrical ground reference for the signal contacts. This is in contrast to the in line stripline approach described above which uses individual ground contacts. The geometric relationship including the pitch p, the thickness t, and the gap h, and the width w can be controlled to obtain the desired connector impedance and electrical performance. Although the in-line stripline configuration has some advantages, which are noted above, it will be understood, that either the in-line stripline or I-Beam [stripline] configuration with grounding plates can be used to obtain the desired electrical performance.

In the claims:

Please amend claims 8, 13 and 22 as follows.

8. The modular mezzanine connector system of claim 1, wherein the plurality of plug contacts and receptacle contacts comprise signal contacts and are disposed in a row with each contact oriented perpendicular to a ground plane [in a stripline I-Beam configuration].

13. The method of claim 10, wherein inserting the plurality of plug contacts further comprises inserting the plurality of plug contacts in a [stripline I-Beam configuration] row with each contact oriented perpendicular to a ground plane and wherein inserting the plurality of receptacle contacts further comprises inserting the receptacle contacts in a [stripline I-Beam configuration] row perpendicular to a ground plane.

22. The modular mezzanine connector system of claim 19, wherein the plug assembly further comprises a plurality of plug contacts disposed in a [stripline I-Beam configuration] row with each contact oriented perpendicular to a ground plane and the receptacle assembly further comprises a plurality of receptacle contacts disposed in a [stripline I-Beam configuration] row perpendicular to a ground plane.

Claims 23-34 have been added.